CIB Priority Themes

Revaluing Construction 2007 - Crossing Boundaries

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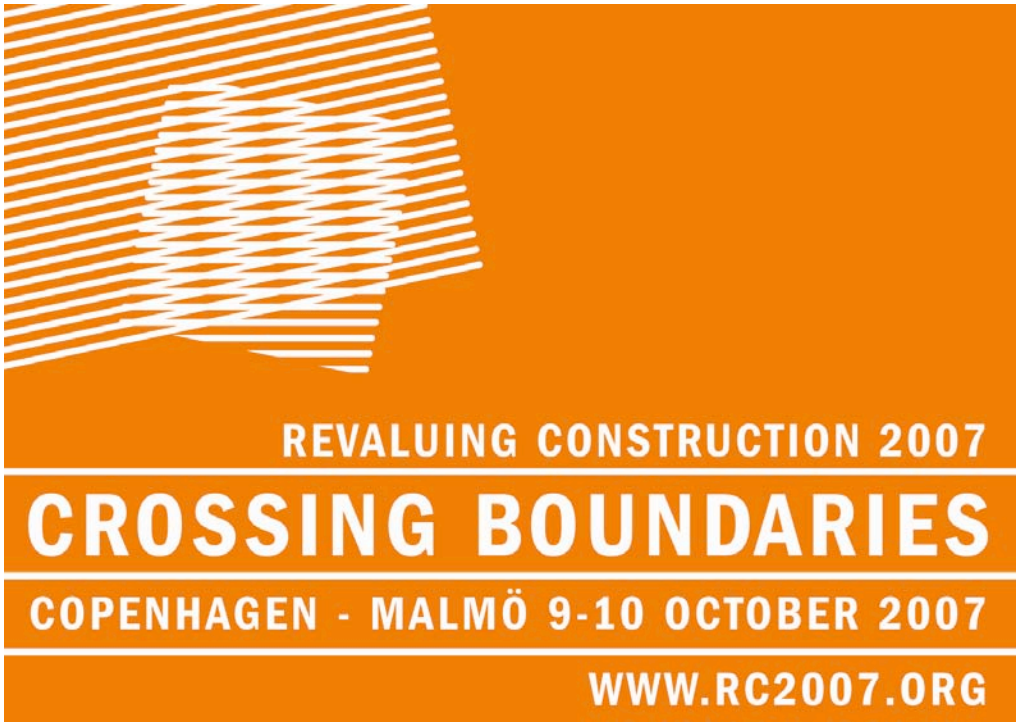
Revaluing Construction 2007 - Crossing Boundaries



By Kim Haugbølle and Roger Courtney

Background

"Crossing Boundaries" was the third in the series of CIB Revaluing Construction Conferences, the first of which took place in 2005 in Manchester, UK and the second one in 2007 in Rotterdam, The Netherlands.

The ambition of Revaluing Construction 2007 - Crossing Boundaries was to show that integration across multiple boundaries is one of the most powerful means of improving both the internal performance and the external perceptions of the construction industry. Almost 200 delegates listened to close to 50 invited speakers from industry, government and research who showed how innovation in management, marketing and technology will enable construction to create greater value for client and users and to be valued by its contribution to the quality of life.

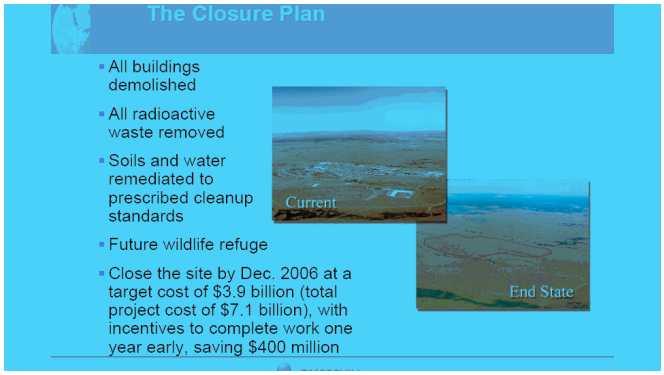
The conference themes included:

- Crossing geographical boundaries - how clients and their suppliers can learn from new ways of working developed in other countries
- Crossing organisational boundaries - overcoming traditional divisions to enhance project performance
- Crossing product boundaries - exploiting new technological developments to raise competitiveness and offer new forms of construction.

Redefining the Boundaries of Construction

Peter Barrett, Professor and Pro-Vice Chancellor at University of Salford, introduced the deliberately rather vague concept of 'revaluing construction'. The concept in itself is an attempt to cross boundaries by expanding our usual conception to encompass not only

the construction industry as such, but to expand our notion into the broader concept of the 'built environment' industry. Not only our perception of construction is being challenged, but also the conditions for construction are changing. Despite the perception of construction as a home market industry, the construction industry like all other industries need to face the challenges of a globalising world to stay competitive as highlighted by Permanent Secretary Michael Dithmer, Danish Ministry of Economic and Business Affairs. In response, Vice-Chair Nancy Tuor, CH2M Hill argued that one way of staying competitive is to develop solutions without boundaries by making a sustained effort to question all taken-for-granted assumptions about construction and management. With this appeal, Tuor elegantly sat the scene for the conference themes scrutinising our understanding of current boundaries of construction.



The Rocky Flats Closure Plan. Source: Nancy Tuor, CH2M Hill, USA

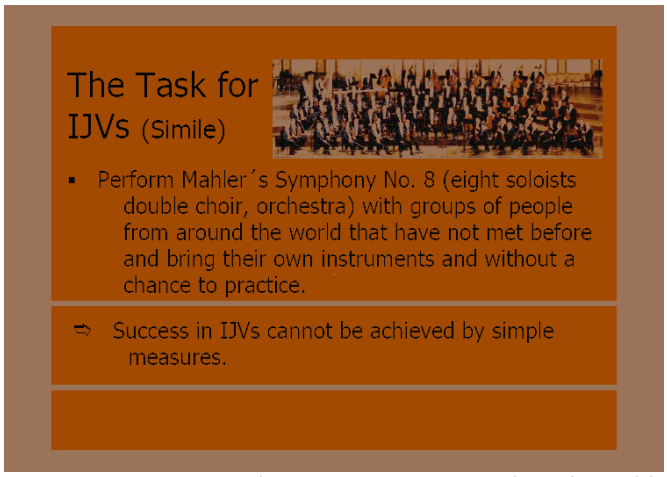
Crossing Geographical Boundaries

The first theme of the conference explored the challenge of globalisation. The conference addressed four crossings of geographical boundaries:

- Value through globalisation – company strategies and operations.
- Taking advantage of international resources.
- Land development in an international marketplace.
- International performance metrics.

First, how do companies deal with the associated challenges of globalisation to provide enhanced value to their clients? The speakers identified three characteristics of company strategies as significant when globalising: 1. Development of a partnership with local interests, which mutually respect the inputs and understanding of each partner. 2. Contractors going global provide management services rather than labour force. 3. Contractors follow their clients going global.

Second, how does construction take advantage of internationally mobile labour and capital? Migration of workforce has both positive and negative impacts like allowing for a rapid economic expansion, limited wage inflation, hampered communication etc. When it comes to the flow of capital, financial institutions are increasingly becoming involved in construction projects, particularly regarding risk management. More generally, taking advantage of international resources in international joint ventures is highly challenging, but research in mapping success factors can not produce elegant formulas for achieving success, just interrelated cognitive maps that are products of sense-making processes.

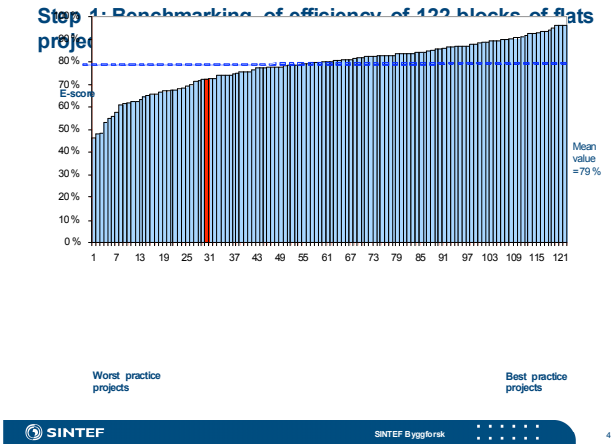


Success in International Joint Ventures cannot be achieved by simple measures. Source: Christian Brockmann, University of Applied Sciences Bremen, Germany

Third, examples of major urban developments from three different parts of the world described various strategies for attracting international investors etc. The Danish example of Carlsberg is characterised by a double-sided strategy of thinking globally and gaining local support through the involvement of the general public and the municipality in an open process. In the South African example of Coega, the core strategy is to succeed by acquiring and developing core competencies in a large number of areas, not just construction. The Chinese case of Shanghai showed how the sheer size of investments and the complexity of the construction activities are reshaping the client/supplier relations e.g. by privatisation, amalgamation of state-owned contractors and development of intelligent network-based models.

Fourth, what makes a construction firm or a whole industry competitive nationally and internationally? A pilot study for the European Commission indicated that the use of industrialised methods of construction, investment in R&D, well trained and well paid site workforce and certain characteristics of the procurement process lead to higher overall efficiency in the construction process on a national scale. Turning our attention to the individual firm, the Construction Industry Institute provided evidence that benchmarking had influenced the adoption of good project practices in the US. Similarly, the five-year

productivity study in Norway has provided evidence that project management is the single most important factor explaining differences in productivity among contractors. Thus, this session illustrated how the systematic collection and analysis of performance data could illuminate, influence and improve practice at different levels: project, firm and national industry.



Benchmarking Norwegian construction firms. Source: Thorbjørn Ingvaldsen, SINTEF, Norway

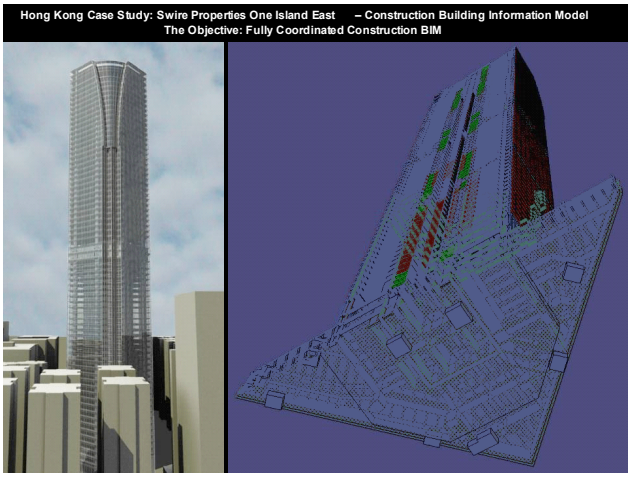
Crossing Organisational Boundaries

The second theme of the conference explored the challenge of overcoming traditional organisational divisions to enhance project performance. The conference addressed four crossings of organisational boundaries:

- Successful project teams – the client as leader and integrator.
- Promoting integration through virtual construction.
- Construction reform programs.
- Spectacular projects – a source of inspiration and innovation.

The first session focused on how clients and their project managers can generate a successful project culture through their leadership and commitment to integration of objectives and operations. The delegates were reminded that the drivers of successful project teams may be found in less obvious places like health and safety. Further, the two presentations on partnering gave insights into the various rationales driving the search and solutions for successful project teams in different contexts. While partnering was originally introduced in the US and the UK as a means to avoid conflict and costly arbitration, partnering in the Nordic countries is promoted as a way to increase user value, shorten building time and diminish defects. Thus, the 'recipe' for developing successful project teams may be highly dependent on the local context.

The second session addressed how integration across organisational boundaries can be achieved through the use of virtual construction. This session explored how new digital technologies and tools facilitate and may even require reorganisation of the construction process in order to exploit their full potential. While the three speakers shared optimism regarding the potential of building information models (BIM), they were also concerned about the difficulties and challenges facing construction in fully realising this potential. In particular, they stressed the need for practical, target-oriented development of building information models and the need for a strong client demanding the use of BIM.



The use of Building Information Models. Source: Martin Riese, Gehry Technologies

The third session focused on results and lessons learned from three construction reform programs: the Dutch reform program PSIBouw, the Construction Industry Development Board (cidb) of South Africa, and the Tang report 'Construction for Excellence' in Hong Kong. The reform programs share a number of focus areas like value and quality for end user and society, professional workforce, improved knowledge infrastructure, safer and environmental focused industry and sustainable profit for the construction industry. A common driver for change applied in the reform programs is cooperation between all the stakeholders of the construction industry and with a strong government commitment. A common strategy for change is greater integration and improved communication across the supply chain. Despite some differences among the construction reform programs, the many similarities with respect to drivers of change, focus areas and objectives are striking.

The fourth session explored the role of spectacular projects as a source of inspiration and innovation of construction outputs and processes. The two examples of spectacular projects included an organisational innovation and a product innovation. The successful delivery of the London Tunnels for High Speed 1, the

Channel Tunnel Rail Link, in a spirit of cooperation and without contractual conflicts has become an exemplar to follow in UK construction when it comes to forming alliances. An example of a spectacular project stimulating product innovation was the development of a system to ensure multi-functionality of a football stadium. The innovative solution has now been patented, and it is being used in other stadiums.

An innovative solution for stadiums: A sliding pitch to move the grass outside the stadium. Source: Frits Scheublin, BAM, The Netherlands

Summing up, although the spectacular projects account for only a small share of the overall market these projects can have profound and far-reaching impacts.

Crossing Product Boundaries

The third conference theme explored the challenge of how new technological developments and changing client requirements are transforming the nature of construction operations and output. The conference addressed four crossings of product and technology boundaries:

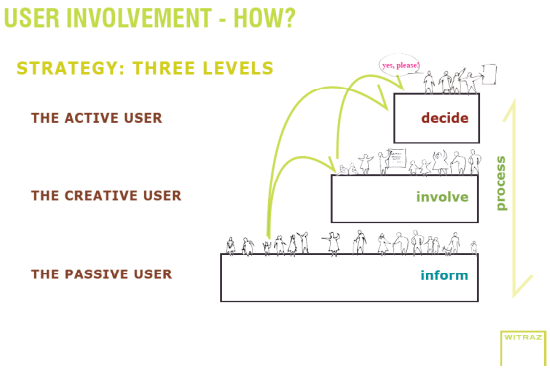
- From short-term delivery to life-term services.
- Moving towards zero-defects: getting it right – the first time.
- Designing for people – user-driven innovation.
- Emerging technologies – redefining the product.

The first session addressed the time perspective – moving from short-term delivery of construction products to life-term services. The session explored what these changes mean for design and operations in relation to lifecycle costing and adaptability. Commissioned by the European Commission, a common conceptual and methodological framework for life cycle costing and performance in the European Union has been established. Frequent demand changes highlight the need to consider not only the life cycle of buildings but also the changing relationship between users and buildings. From an understanding of the dynamics of the organisational life cycle, strategies for adaptability at four different levels were presented: 1. Building concept. 2. Main structure of the building. 3. The general floor layout – 'the footprint'. 4. Work spaces and 'settings'.

The second session spanned various strategies to reduce defects in construction by getting it right – the first time. The Norwegian Building Cost Programme has supported a number of development projects to improve industry performance e.g. through benchmarking and the use of ICT. Another strategy is industrialised manufacturing of housing through control of the complete process, repetition by well defined products, continuous improvement initiatives and customer surveys. Among car manufacturers, supplier management is the new key strategy for performance improvement. Usually, Volkswagen AG builds strategic partnerships with selected suppliers to focus on customer value through a differentiation strategy rather than a pure cost reduction strategy.

Procurement strategies. Source: Markus Neumann, Volkswagen

The third session considered how users can play a role in design and innovation, and how that may be used to create buildings and environments that add value. The Danish example showed how 15 different tools can be applied to have users participate at three different levels: Passive (inform), creative (involve) and active (decide). The French example of the ACCOR hotel chain illustrated how construction clients can drive innovation through co-production of new hotel concepts like Formule 1, Suite Hotels and All Seasons. The British example presented evidence from more than 800 projects on how design can be optimised with inputs from clients and users from the use of design quality indicators (DQI) on functionality, impact and build quality.



Three levels of user involvement. Source: Tina Saabye, WITRAZ Architects

The fourth session gave three examples of very different attempts to redefine the traditional construction product by using new emerging technologies. The first example showed how the emerging technology of fibre-reinforced polymers can be applied to develop new construction products with improved product characteristics. The second example from the health care sector analysed how the health care infrastructure can be redefined by taking into account the complex dynamics linking change in care services, health technologies and built infrastructures. The third example focused on emerging management technologies to measure, compare and evaluate the performance and value of products and services. Within the development project ManuBuild, performance metrics have been developed to describe community perceived values, performance indicators and assessment methods to be used in a new business model.

Are we seeing 'the death of construction' as we know it?

The closing session of the conference addressed global trends and their implications for construction. The final keynote speaker Professor Fred Moavenzadeh, Massachusetts Institute of Technology argued that construction is an industry in transition on both the demand side and the supply side. Changes on the demand side include new trade patterns, realignment of economic blocs, financial innovations, environmental challenges and new types of work to be undertaken. Changes on the supply side include globalisation, manpower and technology.

In the following panel discussion, the panellists debated how the boundaries of construction are being redefined and whether we are seeing the 'death of construction' as we know it as an industry today. The panellists generally acknowledged that new perceptions of the industry are coming into play, and new players are entering the industry. But consensus did not prevail as to whether this implied 'the death of the construction industry' as such. For some, like Sven Landelius, the chairman of the Swedish Construction Clients Association, the need for faster and more far-reaching change of the industry was advocated strongly. For others like Jackson Cheung, Vice President of China State Construction Engineering, a more incremental perspective of change in the industry was put forth in order to reduce risk. Reciting a metaphor by Mao, Cheung argued 'that you cross a river in small steps, because you don't know how deep it is'.

Peter Scuderi, CRC Construction Innovation, Australia, participating in the panel debate

In her final remarks, Lone Møller Sørensen, Director of the Danish Building Research Institute, highlighted five issues:

- Putting the user/client in the driving seat.
- The issue of improving the efficiency of the industry.
- Construction as the framework and foundation for life.
- The importance of proper management: sell, develop and deliver.
- The implications of crossing boundaries.

In his closing words, Wim Bakens, Secretary General of CIB, emphasised three areas to be addressed by a construction or rather built environment industry in transition. 1. The people issue. 2. Technology, more specifically Building Information Models. 3. The re-organisation of the industry.

Perspectives for Construction

The conference gave a comprehensive coverage of how boundaries are being crossed in numerous ways around the globe and the implications hereof.

Firstly, the construction industry or rather the 'built environment' industry is being reshaped by globalisation and at the same time advancing globalisation by its very own actions, strategies etc. To turn a much popular slogan upside down: Construction thinks local but acts de facto global (maybe without even realising it). Clearly both our analytical and empirical perceptions of construction, as we know it, are being challenged by the numerous crossings of geographical boundaries taken for granted hitherto.

Secondly, our attention has been turned towards the various ways in which integration across organisational boundaries may be one of the most powerful means to improve project performance whether by technological, organisational or inspirational means.

Thirdly, our traditional perception of construction products is in various ways being challenged by integration across product boundaries. The speakers at the conference pointed at (some of) the trends that will probably influence the future development of construction products and services.

In conclusion, these crossings offers a range of new challenges and promising opportunities for business, policy and research, but the implications hereof are in no way straightforward and may even be contradictory and self-destructive. Consequently, we may start looking for a more receptive and reflexive perspective of the 'built environment' industry that is less local, less tied to the place/site and less linked to traditional perceptions of the boundaries of construction and buildings.

Conference Organisers

The conference was jointly organised by:

- Danish Building Research Institute, Aalborg University. www.sbi.dk.
- Danish Association of Construction Clients. www.bygherreforeningen.dk.
- Swedish Association of Building and Construction Clients. www.byggherre.se.
- Lund University, Department of Building Sciences, Division of Construction Management. www.lth.se.

Additional Information

For the latest information, please visit www.rc2007.org.

The full conference report with approximately 28 pages can be downloaded here.